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(54) A TROMMEL

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(57) Claim

1. A trommel comprising a generally cylindrical container adapted to be rotated about its longitudinal axis and having a plurality of apertures at least adjacent its discharge end, wherein said discharge end is provided with a substantially frusto-conical spout having an outlet, and at least one vane located within said spout and spaced from the interior surface thereof whereby rocks and other debris above a predetermined size are moved by said vane(s) through said spout and out of said outlet.

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PATENTS ACT 1952
COMPLETE SPECIFICATION

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Complete Specification for the invention entitled:

"A TROMMEL"

The following statement is a full description of this invention,
 including the best method of performing it known to me/us
 HS/101F

The present invention relates to trommel screens, and in particular, to trommel separating screens used in prospecting for minerals.

Many variations of the basic trommel screen are used to break up and separate rocks and large debris from the raw material from which minerals are to be recovered. These prior art arrangements typically comprise an inclined cylindrical container having a large number of holes of a predetermined size in the cylindrical surface. The container is rotated about its longitudinal axis and the "tumbling" action breaks up raw material fed into the higher end of the container. When the raw material is reduced to a sufficiently small size, it passes through the holes in the outer surface of the cylinder and is collected. Large rocks and other debris which cannot be reduced in size travel down the incline of the container and pass out of the lower end. These rocks are, however, often essential to the process of breaking up the raw material and it is therefore desirable to maintain at least some rocks in the container at all times. One method of retaining larger rocks is to fit a screen to the lower end of the trommel so that rocks above a certain size are retained in the container. This method is not, however, particularly satisfactory since eventually the number of rocks build up and some must be removed.

Another difficulty with prior art trommel arrangements is that when the raw material comprises a large portion of clay, for example, quite a large amount of tumbling action may be required to break down large lumps of the raw material and so a screen must be fitted to the discharge end of the trommel so that the larger particles are retained and the lumps of clay

and similar material eventually are broken down. Further, it is necessary to regulate the feed of raw material to most prior art trommels so as to ensure that the material is broken down and falls through the holes in the outer surface of the trommel before reaching the discharge end. If the feed rate is too high, not all the material will be able to fall through the holes in the trommel and will therefore escape out the discharge end.

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It is the object of the present invention to provide a trommel which will overcome, or substantially ameliorate, the abovementioned disadvantages.

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According to one aspect of the present invention there is disclosed a trommel comprising a generally cylindrical container adapted to be rotated about its longitudinal axis and having a plurality of apertures at least adjacent its discharge end, wherein said discharge end is provided with a substantially frusto-conical spout having an outlet, and at least one vane located within said spout and spaced from the interior surface thereof whereby rocks and other debris above a predetermined size are moved by said vane(s) through said spout and out of said outlet. Preferably, the trommel further includes a cover to open and close the outlet.

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One embodiment of the present invention will now be described with reference to the drawings in which: Fig.1 is a perspective view of the trommel of the

preferred embodiment;

Fig. 2 is schematic perspective view of the continuous spiral with the trommel of Fig.1, the exterior the the trommel being shown in phantom;

Fig. 3 is a longitudinal cross sectional view of the cylindrical container of the trommel of Fig. 1;

Fig. 4 is a truncated perspective view of the trommel of Fig. 1 showing a cover for the discharge end; and

Fig. 5 is an end view from the discharge end of the 10 trommel of Fig. 1.

As seen in the drawings, the trommel 10 of the preferred embodiment comprises a generally cylindrical barrel 11 which has a large number of holes 12 formed adjacent the discharge end 13 of the barrel 11. The holes 12 are divided into two separate sizes, the larger holes 15 being closer to the discharge end 13 while the smaller holes 14 are closer to the feed end 16. The area covered by smaller holes 14 has an extent approximately 4 to 5 times the area covered by the larger holes 15.

As best seen in Fig. 2, a continuous spiral 17 extends along the inner surface of the barrel 11 and a frusto-conical spout 18 (Figs. 1,3 and 4) is connected to the discharge end 13 of the barrel 11. The diameter of the spout 18 is less than that of the barrel 11 forming an annular lip 31. Attached to the inner surface of the spout 18 are six vanes 19 which are raised or spaced from the inner surface

of the spout 18 by lugs 20. The vanes 19 are of a generally triangular shape and are inclined from the longitudinal axis of both the barrel 11 and spout 18 so that they push raw material towards the outlet 32. A cover 21 is detachably retained by spring clips 22, the cover 21 being used to contain raw material within the trommel 10 for further breaking up, if necessary.

10 The trommel 10 is supported on a stand 23 which has adjustable legs 24 so that the trommel 10 can be operated on rough terrain. The stand 23 also has a riffled sluice 25 which is situated at the discharge end 13 below the holes 12. The barrel 11 is supported by two spaced pairs of rollers 26 so that the barrel 11 is rotatable by a belt drive 28 from a prime mover or engine 27. A water pump 29 is also driven by the prime mover 27 and its output is connected to a hose 30 which supplies water to the feed end 16 of the trommel 10. If desired, the pump 29 can also supply water to the sluice 25 via a further hose (not illustrated). 10

20 In operation, the trommel 10 is rotated by the belt 28 and engine 27 raw material (not illustrated) is manually fed into the trommel 10 at the feed end 16 and is mixed with the water supplied via the hose 30. The mixture of raw material and water is agitated and moved along the barrel 11 by means of the spiral 17 giving rise to the normal "tumbling" action of a trommel. This tumbling action and any rocks, together

with the added water reduces the size of the coalesced chunks of raw material. When the mixture reaches the holes 12, these chunks have been suitably reduced in size so that the fines pass through the smaller holes 14 and then the slightly large particles pass through the larger holes 15.

The annular lip 31 initially prevents unreduced raw material from being discharged. This material is then further "tumbled" to achieve greater break up 10 of the raw material.

When the raw material in the barrel 11 builds up to the level of the spout 18, the rocks are moved by the vanes 19 whilst the smaller particles pass through the space under the vanes 19. Then the rocks are directed by the vanes 19 such that they are ejected from the outlet 32 of the spout 18.

In the case where the raw material has a high percentage of clay and thus needs to be broken up over a longer period of time, the cover 22 is attached 20 and the larger clay lumps are retained within the trommel 10. The vanes 19 then help to further break-up the larger clay lumps.

The foregoing describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, may be made thereto without departing from the scope of the present invention.

The claims defining the invention are as follows:

1. A trommel comprising a generally cylindrical container adapted to be rotated about its longitudinal axis and having a plurality of apertures at least adjacent its discharge end, wherein said discharge end is provided with a substantially frusto-conical spout having an outlet, and at least one vane located within said spout and spaced from the interior surface thereof whereby rocks and other debris above a predetermined size are moved by said vane(s) through said spout and out of said outlet.
2. A trommel as claimed in claim 1 where each of said vanes is inclined relative to the longitudinal axis of said frusto-conical spout.
3. A trommel as claimed in claim 1 or 2 having a releasably detachable cover which closes the outlet of said spout.
4. A trommel as claimed in any one of claims 1 to 3 wherein the maximum diameter of said spout is less than the diameter of said container thereby forming an annular lip at the discharge end of said container.
5. A trommel as claimed in claim 4 wherein the apertures of said container are of different sizes, the larger size apertures being located closer to said lip.
6. A trommel as claimed in any one of the preceding claims wherein said container includes an interior spiral, the sense of said spiral and the direction

of rotation of said container being arranged to transport raw material from the end of said container opposite said discharge end, towards said discharge end.

7. A trommel as claimed in any one of claims 1 to 6 wherein said trommel is mounted on a frame having adjustable length legs to permit said trommel to be tilted so as to slightly incline said longitudinal axis to the horizontal with said discharge end being inclined downwardly.

8. A trommel as claimed in any one of claims 1 to 7 wherein pump means are provided to flow water through the interior of said trommel towards said discharge end.

9. A trommel as claimed in claim 8 wherein a single prime mover rotates said container and operates said pump means.

10. A trommel substantially as described with reference to the drawings.

DATED this TWENTY-SIXTH day of APRIL, 1985

~~GEORGE REDROFF~~
JOHN MANDIC



Patent Attorneys for the Applicants
SPRUSON & FERGUSON

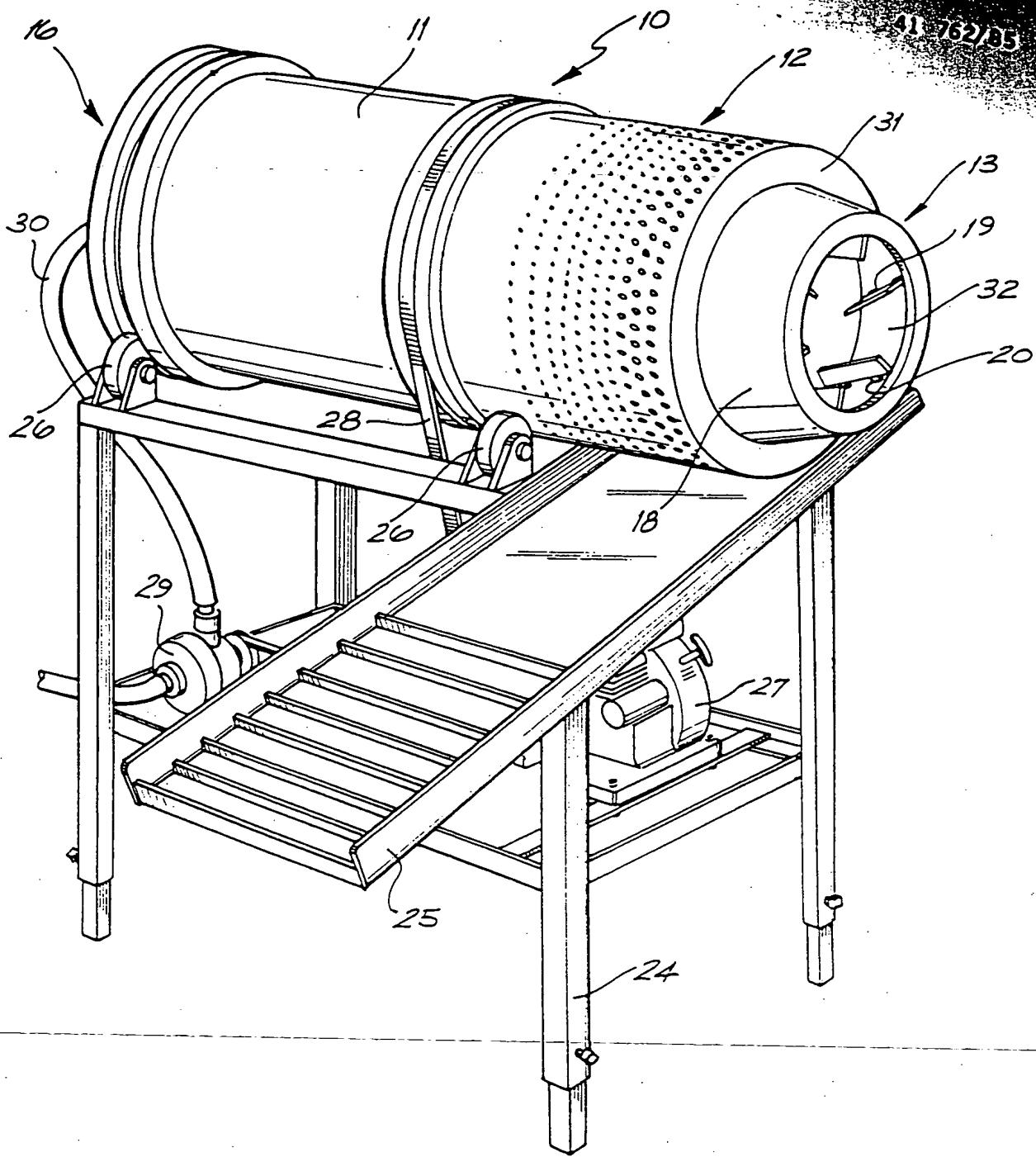


FIG. 1

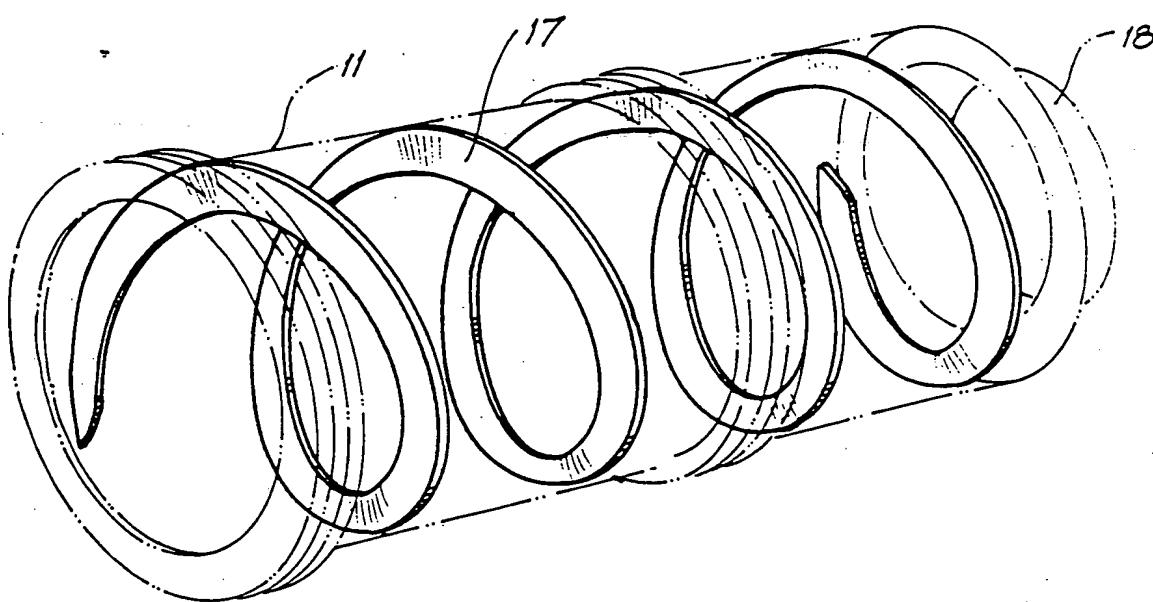


FIG. 2

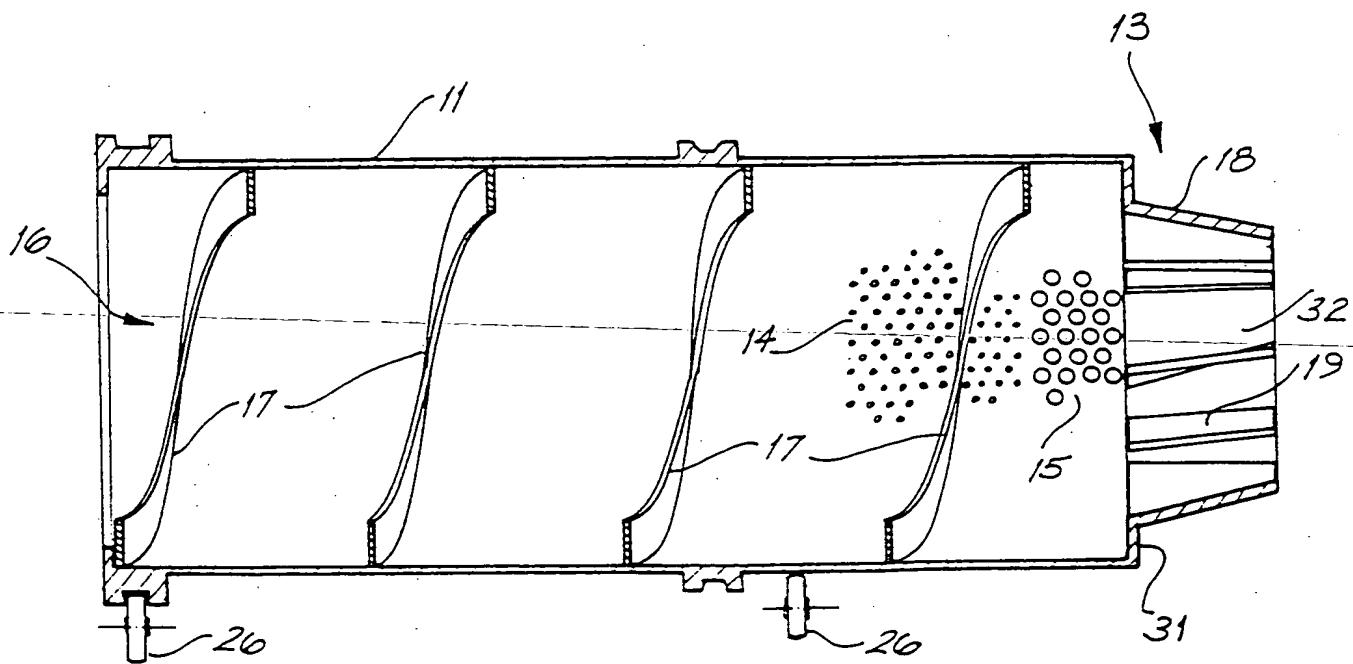


FIG. 3

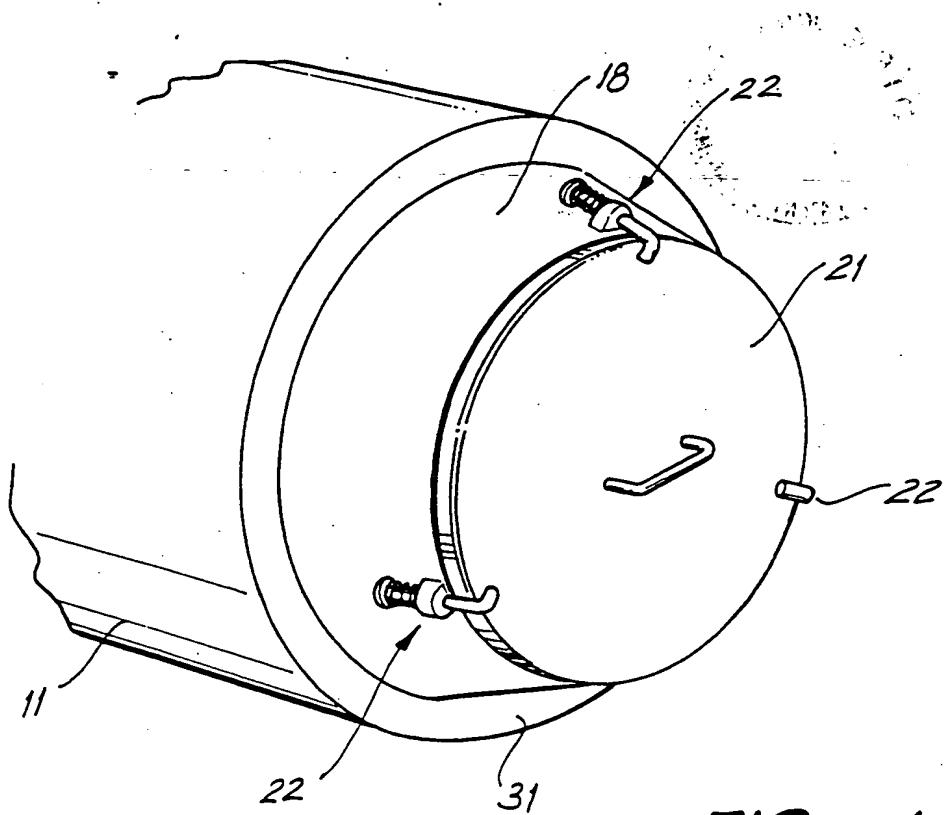


FIG. 4

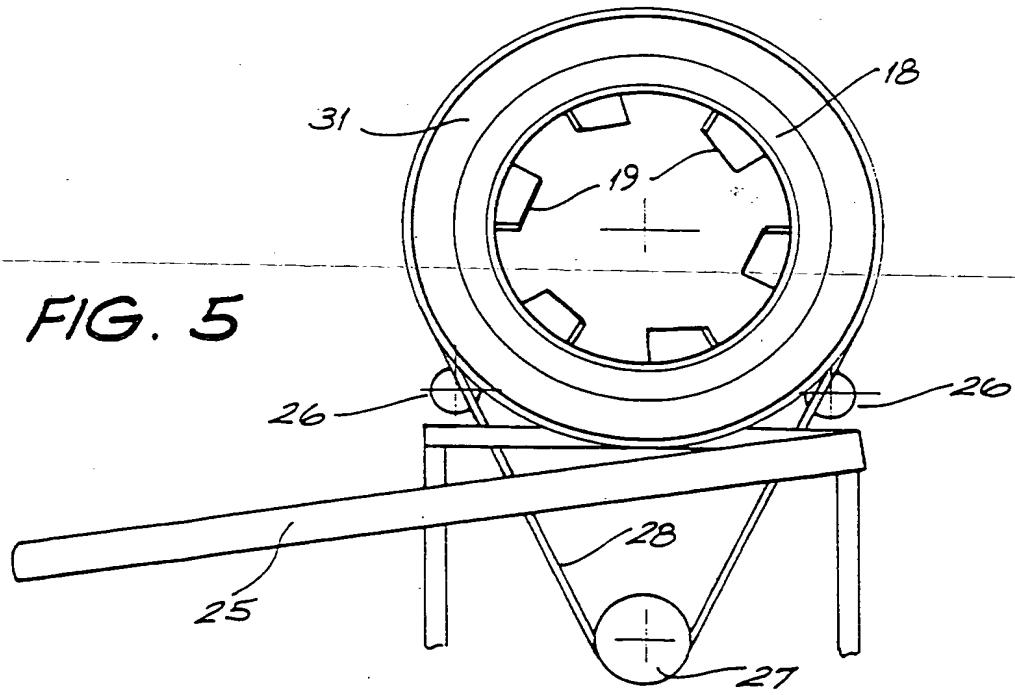


FIG. 5